

The Knowledge Bank at The Ohio State University
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The Broadcasting Station of the Ohio State University

By PROF. R. A. BROWN, *E. E. Department*

HE broadcasting station of the Ohio State University, now known as W E A O, located in the north end of the building now occupied by the Agricultural Engineering Department, had its beginning about three years ago. At that time a small transmitting set capable of covering a radius of ten or fifteen miles under very favorable conditions was used to broadcast on several occasions, a number of victrola records, violin solos and voice. Little did we dream at that time of the extent to which such entertainment would grow or how interested the general public would become in radio almost over night.

Up until about that time comparatively little radio telephone work had been done outside of research laboratories. This was done as development work during the war and practically all radio communication was handled by telegraph. For this reason, due to the fact that all amateur and general radio activities were stopped until after the armistice was signed, the general public was unaware of the rapid strides that had been taking place in bringing this means of communication to a practical stage.

It is not surprising then that people who had always felt that radio was of interest only to the few, wondered and were skeptical when broadcasting began to be attempted and the value and quality of the material sent out raised to such a standard that it appealed to nearly everybody. A great many people were surprised to find that it did not require more than a reasonable amount of patience and experience to learn to operate with thorough satisfaction the apparatus needed for the reception of all telephone broadcasting. This brought about the phenomenal demand for radio receiving apparatus experienced during the past year, which from all indications will be exceeded during the coming year.

The widespread interest in any agency that may be made to serve the public soon causes the development of demands for service in a variety of fields. About two years ago, the Department of Agriculture began the distribution of crop and market news by radio telegraph throughout the eastern section of the United States. This service, which was intended for the agricultural population, soon became so popular that it was extended to cover the entire country. It was not available to all, of course, since it was necessary for the person receiving the information to have a working knowledge of the code. This opened up a new field for the use of the radio telephone and has brought about the development of a rather elaborate chain of radio telephone stations, the primary object of which is the dissemination of news of an agricultural nature.

The Ohio State University was one of the first institutions in the country to offer its facili-

ties in this connection. The first steps were taken about two years ago but did not begin to materialize until about the first of January of the present year. The development and construction work necessary to put the station in operating condition, required a considerable amount of time and it was not until the 19th of June of the present year that regular daily service was started.

The station which was put in service at that time and has been used up to the present consists of a 100 watt transmitting set having under fair conditions a daylight range of about 75 or 100 miles. The station being put in service at the present time will have a power output of 500 watts and will have a reliable daylight range of from 300 to 500 miles.

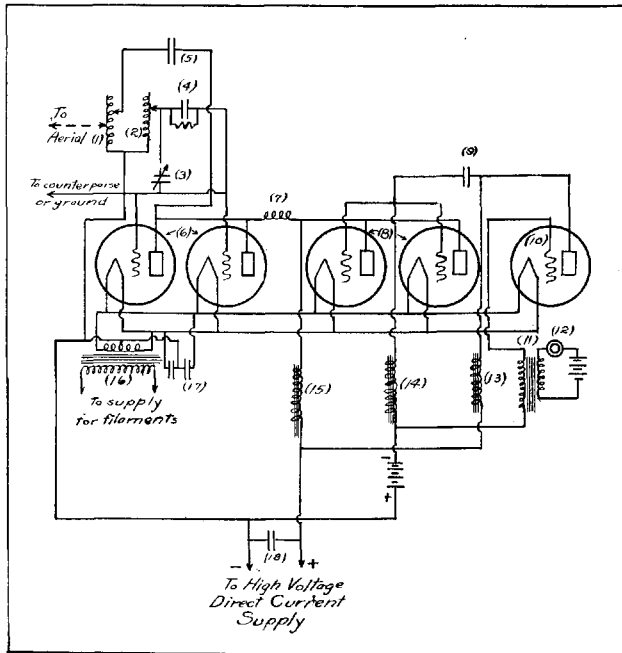
The circuit used in each of these sets is what is known as the "Reversed-feed-back" circuit with "Heising" modulation. It makes use of several power tubes for the purpose of generating a high frequency alternating current to be radiated and used only as a carrier current and several modulator tubes the function of which is to vary the form of the radiated carrier wave so that when received at the receiving station sounds will be produced that are true reproductions of those impressed upon the circuits of the modulator tubes. In addition to the above tubes it is necessary in order to increase the amount of modulation to a practical value, so that the sounds at the receiving station will be as loud as possible, to include other tubes to be used as speech amplifiers. This is found necessary since the telephone transmitters into which the voice or sound to be broadcasted is directed is not capable of producing sufficient effect upon the modulator tubes to properly control the comparatively large amount of energy represented in the radiated carrier wave.

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The essential parts of such a circuit are given in the following diagram.



In the above diagram are shown:

- (1) Aerial and plate tuning inductance
- (2) Grid inductance
- (3) Grid tuning condenser
- (4) Grid condenser and grid leak resistance
- (5) Plate condenser

- (6) Oscillator or generator tubes
- (7) High frequency choke coil
- (8) Modulator tubes
- (9) Coupling condenser
- (10) Speech amplifier tube
- (11) Modulation transformer
- (12) Transmitter
- (13) and (14) Low frequency choke coils
- (15) Constant current choke coil
- (16) Filament transformer
- (17) Bypass condensers
- (18) Filter condensers

In addition to the actual transmitting apparatus of a broadcasting station, a studio having proper acoustic properties is essential. If the sounds produced in the studio are not reasonably free from the effects of reverberation and echo, they cannot be reproduced by the radio equipment so as to sound natural. It is necessary then to supply the studio with proper furniture and hangings to produce these results. This has been accomplished thru the kindness of the Franklin County Ohio State Alumni in the studio at the Ohio State University by the use of heavily folded burlap curtains which are hung several inches from the walls on all sides of the room used for this purpose. The floor is also covered with a heavy carpet which is in turn laid down upon a thick absorbent paper cushion to eliminate sound reflection from the floor of the room.

While the development and operation of the University broadcasting station is under the jurisdiction of the Electrical Engineering Department, every effort is being made to make it of the utmost service to the entire University and to the people of Ohio.